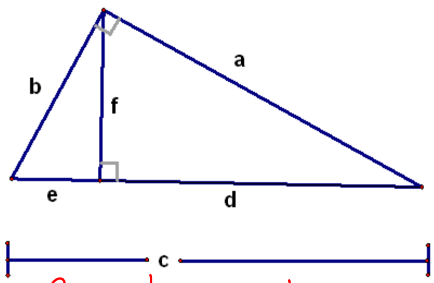



$$\frac{c}{b} = \frac{b}{e} \qquad \frac{d}{a} = \frac{a}{c}$$

$$b^2 = ce \qquad a^2 = dc$$

$$a^2 + b^2 = cd + ce$$

$$c(d+e)$$

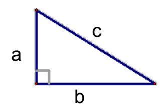
$$c \cdot c$$

$$a^2 + b^2 = c^2$$

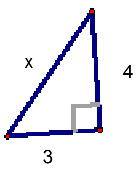
## 7.2 The Pythagorean Theorem

Thm 7.4--The Pythagorean Theorem--In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the legs

$c^2 = a^2 + b^2$




President Garfield

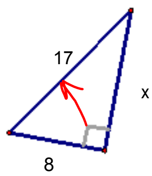



$$x^2 = 3^2 + 4^2$$

$$9 + 16$$

$$\sqrt{x^2} = \sqrt{25}$$

$$x = 5$$




$$17^2 = x^2 + 8^2$$

$$289 = x^2 + 64$$

$$-64 \qquad -64$$

$$225 = x^2$$

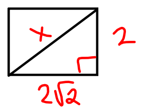
$$15 = x$$

Find the diagonal of the rectangle with width of 2 and a length of $2\sqrt{2}$

$(2\sqrt{2})(2\sqrt{2})$

$4\sqrt{4}$

$4 \cdot 2$




$x^2 = 2^2 + (2\sqrt{2})^2$

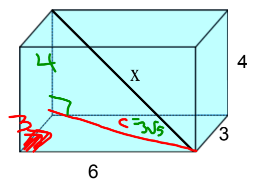
$4\sqrt{4}$

$4 \cdot 2$

$4 + 8$

$\sqrt{x^2} = \sqrt{12}$

$x = 2\sqrt{3}$




$c^2 = 3^2 + 6^2$

$9 + 36$

$c^2 = 45$

$c = 3\sqrt{5}$

$x^2 = 4^2 + (3\sqrt{5})^2$

$9 \cdot 5$

$16 + 45$

$x^2 = 61$

$x = \sqrt{61}$

Pythagorean Triples

3 4 5    5 12 13    8 15 17    7 24 25

6 8 10    10 24 24

9 12 15

Theorem 7-5 The Converse of the Pythagorean Theorem--If the square of one side of a triangle is equal to the sum of the squares of the other two sides, then the triangle is a right triangle.

If $c^2 = a^2 + b^2$, then $\Delta$ is a Right $\Delta$

If $c^2 > a^2 + b^2$, then $\Delta$ is an Obtuse $\Delta$

If $c^2 < a^2 + b^2$, then $\Delta$ is an Acute $\Delta$

c is the largest side

Examples

3, 7, 8 $8^2 > 3^2 + 7^2$

Obtuse $64$ $9 + 49$

$58$

8, 16, 17 $17^2 < 8^2 + 16^2$

Acute $289$ $64 + 256$

$\sqrt{5}$ $\sqrt{20}$ $6$ $6^2 > \sqrt{5}^2 + \sqrt{20}^2$

Obtuse $36$ $5 + 20$

What type of triangle is $\Delta ABC$?

A(-9, -3)

B(1, -1)

C(-3, -7)

$d = \sqrt{(x_2 - x_2)^2 + (y_2 - y_1)^2}$

$AB = \sqrt{104}$

$BC = \sqrt{52}$

$\sqrt{104}^2 = \sqrt{52}^2 + \sqrt{52}^2$

$104 = 52 + 52$

Right

$AC = \sqrt{(-9 - -3)^2 + (-3 - -7)^2}$

$AC = \sqrt{52}$ $36 + 16$

HW

p354

12-16, 19,22-24, 27 (Is it right, obtuse, or acute?)